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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/753,000	01/05/2004	Thomas E. Harbin	02-0611	6475

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EXAMINER
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MITCHELL, KATHERINE W

ART UNIT	PAPER NUMBER
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3677

DATE MAILED: 10/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/753,000

Applicant(s)

HARBIN ET AL.

Examiner

Katherine W. Mitchell

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE \_\_\_\_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 7/26/05
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 5/20/05 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.

- 4) ☒ Interview Summary (PTO-413) 20051011  
Paper No(s)/Mail Date. \_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Applicant is claiming a swage type fastener, comprising a pin and a collar. However, additional claim limitations include requirements for comparisons of multiple pins in multiple applications, which are not claimed. Further, examiner notes that apparatus claims consider only structural limitations, and a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In all independent claims, applicant has claimed geometries defined by their use either in a shear application or a tension application, which cannot patentably distinguish apparatus. An apparatus cannot be claimed by comparison to the apparatus in another application. Elaborating on this to make it clearer, examiner notes that, for example, applicant claims a crest and groove geometry with "lock grooves are provided with the longest width required for collars of lower strength for a shear application of greater strength for a tension applicant, and the crests...". How would one know the metes and bounds of this claim, and how could one

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determine if he was infringing on this claim? What is “greater”, “satisfactory”, “adequately”? How can a single fastener, comprised of a single pin and a single collar, be compared to itself?

In particular, look at claim 2, depending on claim 1. Claim 2 recites “the collar of lower strength...” and “the collar of greater strength”, but claim 1 recites only one collar. Examiner cannot determine how to examine such a claim, as it appears to broaden or contradict the independent claim.

Similarly, Applicant now claims a single pin and single collar, but then recites “the pin having a uniform lock groove and crest geometry for each pin diameter.” How is this possible? “Selected from...” wording is not a positive recitation of structure -- isn’t any and every collar and pin selected from some material and some diameter? Those not chosen are no longer positively recited, and thus are not in the claim.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-2, 5-7, 9-10, 13-15, 17-19, and 22-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Ruhl et al. USP 4472096, hereafter called Ruhl. As noted above, differences in applications of structures not described are not given patentable weight as long as the cited structures are capable of the limitation.

Re claims 1, 9, and 18: Ruhl teaches a swage type fastener capable of securely

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fastening a plurality of workpieces together in a plurality of applications having different load requirements, the fastener comprising:

a pin of a diameter with an elongated shank and terminating at one end with an enlarged head, and at the other end having a grooved portion (Figs, col 2 lines 23-52)

a tubular collar swaged into the lock grooves, the collar having lock grooves and shoulders interlocking the lock grooves and crests (formed during swaging, best seen in Figs 4-6, see col 2 lines 59-66), the collar and pin formed of different materials (col 4 lines 18-19). If the collar is selected from a plurality of collars of different materials, then the lock grooves will be filled with any one of the different materials (of the collar).

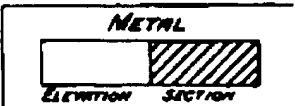
Examiner does not know how a single pin (all that is claimed) can suddenly be described as having a specific geometry for each pin diameter - only one pin is claimed.

Relative features between applications of the pin and collars could be selected to meet such limitations, see col 3 lines 31-38 and throughout.

Re claims 2,10, 17, 19: Relative features between applications of the pin and collars could be selected to meet such limitations, see col 3 lines 31-38 and throughout.

Re claims 5,13,22: Overpacking of about 20% is taught in col 7 lines 1-29.

Re claims 6,14,23: Workpieces are at least capable of being metal, and note

that MPEP 608.02 shows metal as:  which corresponds to the hatching of "18" and "20", the workpieces of Ruhl in the Figures.

Re claims 7,15,24: Applications including shear, shear/tension, shear composite, or shear/tension composite applications are taught in col 4 lines 8-38.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 3-4, 11-12, 20-21 and 8,16,25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ruhl.

Re claims 3-4, 11-12, 20-21: Ruhl teaches that pins and collars are designed for specific applications and that titanium is lighter, stronger, and more expensive than aluminum. Ruhl also teaches that aluminum, steel, and titanium alloys are used as materials for swage-type fasteners in col 4 lines 28-63, and col 5 lines 23-65 specify that the compressive yield strength (fcy) of the collar material is an important factor. Inevitably, high strength collars would be titanium alloys, and low strength collars would be aluminum alloys depending on application. It would have been considered obvious to one of ordinary skill in the art, at the time the invention was made, to have selected the collar material to meet the strength requirements of the application, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Re claims 8,16,25: A fastener capable of fastening workpieces that vary in thickness up to 1/8 of an inch is taught throughout, including col 8 lines 25-34 and col 11 lines 60-65:

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Note that it is desirable that a fastener of a given size be capable of securing workpieces varying in total thickness. The fastener 10 of FIGS. 1 and 2 has that capability. Thus, FIGS. 1 and 2 depict the fastener 10 with workpieces 18 and 20 having the minimum total thickness for that fastener. With the minimum total thickness, the fastener 10 will have one lockgroove 26e only partially filled whereby the lockgrooves 26a-26d will be filled and will be effective to carry the tension load (see FIG. 2).

.....

8. a.Length of that portion of shank 15 extending beyond workpieces 18, 20 to the root of last groove (26e) for nominal (grip) combined thickness for pin with grooves  $26a-e=0.209$ " (see 15p in FIG. 6).
- b. Grip range for variations in thickness of workpieces 18, 20 for pin with grooves  $26a-e=0.094$ ".

It would have been considered obvious to one of ordinary skill in the art, at the time the invention was made, to have designed the fastener for a grip range of up to  $1/8$ ", since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable range involves only routine skill in the art. *In re Aller*, 105 USPQ 233. Ruhl teaches that a larger grip range is desirable to allow for varied workpiece thicknesses, and thus the maximum allowable range would be based on costs, application, and materials to optimize the fastener.

### ***Response to Arguments***

7. Applicant's arguments filed 7/25/2005 have been fully considered but they are not persuasive. First, examiner notes that numerous draft amendments have been reviewed, and are considered more in keeping with current US practice for apparatus claims, but examiner cannot determine an allowable wording. The method of using the pins and collars has been previously allowed in a related case. However, applicant is now claiming A FASTENER, comprising A pin and A tubular collar. Once the single collar and single pin are assembled, examiner can find no structural difference between

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that fastener and prior art fasteners such as Ruhl, which has a pin which is some diameter of many possible diameters, a collar of some material of many different materials, etc. The structure as claimed must be identifiable, and the claimed structure is a single fastener of a pin and a collar.

8. Applicant is correct that an apparatus' features may be described functionally or structurally, but a functional description must uniquely distinguish the claimed structure over the prior art. A single fastener, such as Ruhl's, includes a pin of a diameter and a collar of a material.

9. Applicant's arguments regarding claims 9 and 18 are directed entirely to how the fastener performs in multiple applications. Again, it does not seem to examiner that this refers to a single unique fastener, but numerous fasteners of different materials, diameters, groove and crest geometries. Examiner just does not know what is being claimed. This returns to the 112 problems. If there is only one fastener, it is known to have the fastener optimized.

10. Applicant notes that Ruhl teaches fasteners used only in shear. However, applicant claims "the applications are selected from the group consisting of shear...". Again, since applicant claims only one fastener, the finished fastener is used in only one application.

11. Ruhl teaches against only certain collar materials - materials of excessive strength like titanium - in certain pins. However, multiple collar materials are clearly permitted, citing the entire section. Note especially lines 55-57- a single pin with multiple collar materials as possible:



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To optimize the fastener, however, it is desirable to minimize the total volume of material of that portion of the shank 15 required to carry the lockgrooves 26a-e. This can be done by closely balancing the shear and tensile strengths of the material used in the collar 14, e.g. aluminum alloy, with that of pin 12, e.g. titanium alloy. In swage applications, however, if the collar 14 is of excessive strength, damage to the shank 15 in the area of the lockgrooves 26a-e will result during swage. Most commonly this will occur as crushing or elongation of the shank 15 and/or damage to the crests of the shoulders defined by lockgrooves 26a-e during swaging. It has been known that it is desirable to avoid and/or minimize such damage. In the present invention it is desirable to provide the collar 14 with as high a tensile yield strength as possible while avoiding the above noted damage. For this purpose, it has been found that tensile yields can be equated to ultimate material shear stress and that it was desirable to utilize a pin member 12 of a material having an ultimate shear stress in a range of from around 1.8:1 to around 2.7:1 relative to the ultimate shear stress of collar 14. In one application utilizing a pin 12 of 6Al-4V titanium alloy and a collar 14 of 2024-T4(2) aluminum alloy a desirable ratio of around 2.5:1 resulted. An example of another suitable combination of different materials having the desired ratio is a pin 12 of 7178-T6 aluminum alloy and a collar 14 of 6061-T4 aluminum alloy; another combination can be of a pin member 12 of heat treated 8740 alloy steel and a collar 14 of 7175-T73 or 7050-T73 aluminum. By maximizing the strength of the collar 14 to a point where swaging can be accomplished just short of damage to the pin member 12, the number and/or combined length of lockgrooves 26a-e required to support the shear stress resulting from tension loading can be minimized; thus a low ratio is desirable. It is also desirable, as noted, that the width of grooves 26a-e and shoulders defined thereby be proportioned relative to the shear strengths of the materials of pin 12 and collar 14 such that both the shoulders defined by grooves 26a-e of the pin 12 and the shoulders defined by interlocking grooves of

12. Examiner believes the applicant's concept here is likely patentable, but is at a loss to suggest how to describe it other than as a method of using or making the fastener, and applicant is claiming the fastener as a finished product. Perhaps a kit or

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system, but applicant must be clear that multiple pins and multiple collars are present, and are assembled to form multiple different finished fasteners of the functionality described.

***Conclusion***

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine W. Mitchell whose telephone number is 571-272-7069. The examiner can normally be reached on Mon - Thurs 10 AM - 8 PM.


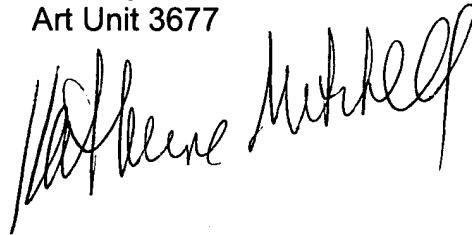
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, J. J. Swann can be reached on 571-272-7075. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

10/11/2005

Katherine W Mitchell  
Primary Examiner  
Art Unit 3677



ROBERT J. SANDY  
PRIMARY EXAMINER